

WHAT IS CLAIMED IS:

1. A data transmission system having a sending unit and a receiving unit, the sending unit comprising:

signal generating means for generating a signal that varies within a predetermined range;

converting means for converting the signal having the predetermined range to generate a digital value with a resolution of K bits;

compressing means for compressing the digital value generated by the converting means to generate a digital signal of L bits, wherein L is smaller than K; and

sending means for sending the digital signal generated by the compressing means to the receiving unit,

wherein the compressing means includes determining means for determining whether the digital value generated by the converting means is within a given range,

wherein, when the digital value is outside the given range, the digital signal of L bits is generated by dividing the digital value by a first divisor,

wherein, when the digital value is within the given range, the digital signal of L bits is generated by dividing the digital value by a second divisor, and

wherein the first divisor is  $2^{(K-L)}$ , while the second divisor is less than  $2^{(K-L)}$ .

2. The data transmission system of Claim 1,

wherein the sending unit further comprises:

mirror signal generating means for generating a mirror signal by reversing the digital signal generated by the compressing means, and

wherein the sending means sends the mirror signal along with the digital signal.

3. The data transmission system of Claim 2,

wherein, when the sending means sends the mirror signal along with the digital signal, the sending means divides the digital signal and the mirror signal into portions, each of the portions is formed of certain bits, and serially sends the divided portions.

4. The data transmission system of Claim 1,

wherein, when the given range is within a range covered by a digital signal of L bits, the second divisor is designated as  $2^0 (= 1)$  and the digital value within the given range has one to one correspondence with the generated digital signal of L bits.

5. The data transmission system of Claim 4,

wherein the signal generated by the signal generating means varies in a time series,

wherein the sending unit repeatedly sends, in the time series, the digital signal corresponding to the varied signal, and

wherein the receiving unit comprises:

recognizing means for recognizing whether the received digital signal is generated by dividing the digital value by the first divisor;

dividing means for dividing by the first divisor the received digital signal that is recognized to be not generated by dividing the digital value by the first divisor; and

decoding means for reproducing the signal generated by the signal generating means by combining in the time series the digital signal generated by dividing the digital value by the first divisor by the compressing means and the digital signal divided by the first divisor by the dividing means.

6. The data transmission system of Claim 1,

wherein the signal generated by the signal generating means varies in a time series,

wherein the sending unit repeatedly sends, in the time series, the digital signal corresponding to the varied signal, and

wherein the receiving unit comprises:

selecting means for selecting the received digital signal that is generated by dividing the digital value by the second divisor by the compressing means;

coordinating means for coordinating the selected digital signal by applying, to the selected digital signal, multiplication by a value of the second divisor and division by the first divisor; and

decoding means for reproducing the signal generated by

the signal generating means by combining in the time series the digital signal generated by dividing the digital value by the first divisor by the compressing means and the digital signal coordinated by the coordinating means.

7. An occupant protection device provided in a vehicle, including:

a protecting unit for protecting an occupant of the vehicle;

a plurality of satellite sensors, each of the satellite sensors having

an impact measuring unit for measuring an impact applied to the vehicle, and

a sending unit for sending a signal representing the impact measured by the impact measuring unit; and

a start controlling unit for controlling start of the protecting unit based on the signal sent by the sending unit,

the sending unit comprising:

converting means for converting the signal having a predetermined range to generate a digital value with a resolution of K bits; and

compressing means for compressing the digital value generated by the converting means to generate a digital signal of L bits, wherein L is smaller than K,

wherein the sending unit sends to the start controlling unit the digital signal generated by the compressing means,

wherein the compressing means includes determining means for determining whether the digital value generated by the converting means is within a given range,

wherein, when the digital value is outside the given range, the digital signal of L bits is generated by dividing the digital value by a first divisor,

wherein, when the digital value is within the given range, the digital signal of L bits is generated by dividing the digital value by a second divisor, and

wherein the first divisor is  $2^{(K-L)}$ , while the second divisor is less than  $2^{(K-L)}$ .

8. The occupant protection device of Claim 7,

wherein the sending unit further comprises:

mirror signal generating means for generating a mirror signal by reversing the digital signal generated by the compressing means, and

wherein the sending unit sends the mirror signal along with the digital signal.

9. The occupant protection device of Claim 8,

wherein, when the sending unit sends the mirror signal along with the digital signal, the sending unit divides the digital signal and the mirror signal into portions, each of the portions is formed of certain bits, and serially sends the divided portions.

10. The occupant protection device of Claim 7,

wherein, when the given range is within a range covered by a digital signal of L bits, the second divisor is designated as  $2^0 (= 1)$  and the digital value within the given range has one to one correspondence with the generated digital signal of L bits.

11. The occupant protection device of Claim 10,

wherein the signal generated by the signal generating means varies in a time series,

wherein the sending unit repeatedly sends, in the time series, the digital signal corresponding to the varied signal to the start controlling unit, and

wherein the start controlling unit comprises:

recognizing means for recognizing whether the received digital signal is generated by dividing the digital value by the first divisor;

dividing means for dividing by the first divisor the received digital signal that is recognized to be not generated by dividing the digital value by the first divisor; and

decoding means for reproducing the signal generated by the signal generating means by combining in the time series the digital signal generated by dividing the digital value by the first divisor by the compressing means and the digital signal divided by the first divisor by the dividing means.

12. The occupant protection device of Claim 7,

wherein the signal generated by the signal generating means varies in a time series,

wherein the sending unit repeatedly sends, in the time series, the digital signal corresponding to the varied signal, and

wherein the start controlling means comprises:

selecting means for selecting the digital signal that is generated by dividing the digital value by the second divisor by the compressing means;

coordinating means for coordinating the selected digital signal by applying, to the selected digital signal, multiplication by a value of the second divisor and division by the first divisor; and

decoding means for reproducing the signal generated by the signal generating means by combining in the time series the digital signal generated by dividing the digital value by the first divisor by the compressing means and the digital signal coordinated by the coordinating means.

13. The occupant protection device of Claims 7,

wherein the satellite sensors are disposed around both sides of the vehicle to measure an impact applied to the vehicle in a lateral direction of the vehicle, and

wherein the start controlling unit controls the start of the protecting unit based on the signals sent from the satellite sensors.